Results: Significant CAD (≥50% luminal diameter stenosis) was detected in 66 patients (79%). The sensitivity, specificity and accuracy of ischemic pattern at DSE for the diagnosis of CAD were 73% (CI 63–82), 83% (CI 75–91) and 75% (CI 66–84). Those for MIBI were 67% (CI 75–77), 83% (CI 75–91) and 70% (CI 60–80), respectively (p = NS vs DSE). Significant CAD was detected in 123 (49%) of the 252 analyzed arteries. Sensitivity, specificity and accuracy of DSE for the regional diagnosis of CAD were 63% (CI 56–69), 90% (CI 84–94) and 77% (CI 72–82). Those for MIBI were 58% (CI 51–64), 91% (CI 87–94) and 75% (CI 69–80), respectively (p = NS vs DSE). LVH was detected in 59 patients (70%) by echocardiography and did not influence the overall or regional specificity of DSE or SPECT. *Conclusion:* DSE and MIBI SPECT have a comparable accuracy for the diagnosis of CAD in hypertensive patients. These patients should not be considered as unsuitable candidates for stress myocardial perfusion scintigraphy in presence or absence of LVH.

965-101 Predictors of Left Ventricular Geometry in Normotensive Youth with Family Histories of Essential Hypertension (EH)

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Relative wall thickness (RWT), a measure of left ventricular (LV) geometry, predicts cardiovascular events independent of LV mass. To evaluate the determinants of RWT, we studied 109 normotensive youth with a family history of EH (mean age 12.9 ± 2.9 years at initial visit; 68% African-American (AAs); 47% female). Anthropometrics, heart rate, blood pressure (SBP, DBP), cardiac output and total peripheral resistance (TPR) were measured at rest, and before, during, and after each of 4 behavioral/physical stressors. RWT and LVID were derived from 2-D directed M-mode-echocardiography at the initial and follow-up (fu) visits an average of 2.5 years apart. Univariate and hierarchical multiple regression techniques were used to examine relations between RWT_{FU} and $LVID_{FU}$ with all variables from visit-1. *Results:* RWT_{FU} was significantly related to baseline RWT, ethnicity, resting TPR, and TPR peak and/or reactivity change scores to all 4 stressors (r range = 0.22 to 0.29, all ps < 0.05). RWT_{FU} was predicted by baseline RWT, resting TPR, TPR reactivity to parent-child discussion, and the interaction of ethnicity by SBP postural change reactivity (total model $R^2 = 0.29$), $p < 0.0001$). $LVID_{FU}$ was positively related to baseline LVID, age, height, weight, sum of skinfolds, body surface area and resting SBP (r range = 0.38 to 0.58, all ps < 0.001). $LVID_{FU}$ was also positively related to peak SBP and/or TPR reactivity to all 4 stressors (r range = 0.27 to 0.36, all ps < 0.01) and negatively related to resting heart rate ($r = -0.38$, $p < 0.0001$). Independent predictors of $LVID_{FU}$ were baseline LVID, weight, gender (M > F), SBP video game reactivity, TPR postural change reactivity, and the interaction of gender and weight (total model $R^2 = 0.67$, $p < 0.0001$). *Conclusions:* African-American youth with family history of EH, may develop concentric remodeling prior to establishment of EH. Hemodynamic reactivity independently predicts future LVID and RWT even after controlling for baseline LV geometry and classic EH risk factors.

965-102 Is Insulin Action a Determinant of Left Ventricular Relaxation in Uncomplicated Hypertension?

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We examined the relation of insulin action to Doppler indexes of left ventricular (LV) diastolic function in a population of 26, newly diagnosed, hypertensive men. Exclusion criteria were congestive heart failure, coronary and valvular heart disease, diabetes and family history of diabetes, use of cardiac and metabolic drugs. Patients underwent Doppler echocardiography and glucose clamp combined to indirect calorimetry. According to the level of clamp-derived whole-body glucose disposal (WBGD), patients were divided into 2 groups: 20 with insulin resistance (WBGD < 33 μmol/kg × min) and 6 with normal insulin sensitivity. The 2 groups were comparable for age, body mass index, heart rate and blood pressure. No difference in Doppler indexes of LV diastolic filling was found between the 2 groups. Isovolumic relaxation time was mildly prolonged in patients with insulin-resistance (p = 0.04). In the whole population, isovolumic relaxation time had univariate relations with LV mass index ($r = 0.55$, $p = 0.003$), WBGD ($r = -0.55$, $p = 0.003$) and non-oxidative glucose metabolism ($r = -0.52$, $p = 0.006$). By a multiple linear regression analysis including age, body mass index, heart rate, diastolic blood pressure, LV mass index and WBGD as potential determinants, only LV mass index ($\beta = 0.38$, $p = 0.04$) and WBGD ($\beta = -0.37$, $p < 0.05$) were independent predictors of isovolumic relaxation time in the pooled population, explaining 41% of the total variance. In conclusion, in uncomplicated hypertension the insulin resistance is a determinant of abnormalities in LV ventricular relaxation, independent on the influence exerted by increased after-load, overweight and LV hypertrophy.

966 New Developments in the Use of Diagnostic Exercise Testing

Monday, March 17, 1997, 3:00 p.m.–5:00 p.m.
Anaheim Convention Center, Hall E
Presentation Hour: 3:00 p.m.–4:00 p.m.

966-66 Detecting Coronary Artery Disease: Value and Cost-effectiveness of Noninvasive Tests

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The goal of our study was to evaluate the capacity and cost-effectiveness of three noninvasive diagnostic strategies for detecting coronary artery disease. We reviewed records of all patients who underwent cardiac catheterization in the first quarter of 1994; 132 patients with exertional angina, without previous coronary events or invasive intervention, were included. All patients were evaluated by clinical examination and risk factor assessment; 110 underwent stress testing; 55 had thallium imaging. We used logistic regression to calculate sensitivity, positive predictive value (PPV), and false-positive rates of three models of noninvasive strategies for detecting coronary artery disease. Based on these results and a review of current literature, we assessed the cost-effectiveness of the models, using a hypothetical population of 1000 patients with demographic characteristics similar to our patients. Evaluation of the quality of chest pain with risk factor analysis (Model 1) yielded a sensitivity of 76.7% and positive predictive value of 72.7%. With addition of stress testing (Model 2), sensitivity increased to 83.6% and PPV to 76.1%. With addition of thallium imaging (Model 3), sensitivity was 90.3% and PPV was 77.8%. Analysis of costs for each model was adjusted by adding the costs of inappropriate coronary angiographies, calculated on the basis of false-positive rates. Analysis revealed that inappropriate angiographies were less costly than noninvasive tests performed to avoid them. We found that clinical examination with risk factor analysis is the most cost-effective and reasonably sensitive method of detecting coronary artery disease in patients with exertional angina pectoris.

966-67 The Safety of Exercise Stress Testing in Patients with Abdominal Aortic Aneurysms

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Exercise stress testing is typically preferred to pharmacologic stress testing for patients who are able to exercise. The safety of exercise stress testing in patients with abdominal aortic aneurysms (AAA) has not yet been established and the risk of aneurysm enlargement or rupture is unknown. We identified 293 patients with abdominal aortic aneurysms of at least 4 cm in diameter seen at the Mayo Clinic between 1982–1995 who underwent treadmill exercise stress testing (treadmill ECG, myocardial perfusion or echo). The mean age was 69 years, 91% were male, 57% had hypertension, 31% were on β-blockers, and 67% had known or suspected coronary artery disease prior to stress testing. Thoracic aortic enlargement was present in 6% of the patients and 1% had prior AAA repair. The average diameter of the aneurysm was 5.4 ± 1.1 cm. There were 99 patients with 4–4.9 cm aneurysms, 98 with 5–5.9 cm, 70 with 6–6.9 cm, and 26 with 7 cm or greater. These patients exercised for an average of 7 ± 2 METS. The mean systolic blood pressure at rest was 137 ± 22 mmHg and with exercise rose to 174 ± 29 mmHg. Only one patient with a 6.1 cm AAA developed worsening pain twelve to eighteen hours after stress testing. On repeat imaging the aneurysm showed a contained rupture. No other negative outcomes were documented.

Conclusion: Despite theoretical concerns, exercise stress testing of patients with an abdominal aortic aneurysm appears to be safe, with a low incidence (0.3%) of adverse events.

966-68 Relationship Between the Walk Tests and Height, Weight and Body Surface Area in Advanced Heart Failure

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The 6- and 12-minute walk tests are inexpensive, safe and assess submaximal exercise capacity in heart failure. Cardiopulmonary exercise testing predicts prognosis in heart failure. We determined the relationship between 6- and 12-min walk tests with VO_2peak and to determine whether height, weight, or other factors affect walk results. Patients performed either 6- or 12-min walk tests, as well as cardiopulmonary exercise testing, radionuclide ventriculography, right heart catheterisation, and echocardiography within 1